



INVESTIGATION OF EFFECTS OF 8 WEEKS ZUMBA EXERCISE OF WOMEN ON HEALTH RELATED PHYSICAL FITNESS FACTORS

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Abstract:

In this study, effects of 8-weeks zumba exercise on body weight, aerobic fitness, leg and back strength, grabbing strength, subcutaneous fat thickness, body fat percentage, blood pressure and resting pulse are investigated. 20 sedentary women participated in the study voluntarily. 60-minute zumba exercises were applied in three days a week. The study was scheduled for a single group as pretest-posttest. Physiological and physical values of the subjects were taken before and after the 8 weeks work out program and paired t test statistical technique was used for analyzing data. According to analysis results, significant difference was found with regard to body weight, flexibility, aerobic fitness, leg and back strength, body fat percentage of the subjects ($p < 0.05$). Significant differences were not encountered for dominant grabbing strength, blood pressure and resting heart rate ($p > 0.05$). In conclusion, in our study conducted with the aim of searching effects of 8-weeks zumba work out on health related physical fitness factors in women, it was found that zumba exercise had a positive effect on body weight, body fat rate, flexibility, leg and back strength, max vo2 values.

Keywords: woman, zumba, physical fitness

1. Introduction

Although physical fitness is discussed within every segment of the society, the difficulty in defining it, requires clarification of what is meant with this term (Saygın, Polat and Karacabey, 2005). Exercises performed in order to improve physical fitness should have a dynamic, rhythmic and aerobic structure covering a wide group of muscles, exercising frequency should be 3-5 days a week with an intensity between 60-90% of maximum heart rate or between 60-70 % of heart rate reserve and with a duration of 20-60 minutes. If an exercise program bearing these qualities and quantities is implemented for 8 to 10 weeks, it provides improvement for the physical and

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physiological features of the individual and ensures enhancement in physical fitness (Koşar, Kin and Aşçı, 1998).

Benefits of exercises for people of all ages come to light day by day. Importance of sport activities required to remedy some kinds of health and physiological problems of people who prefer monotonous life style, manifests itself in every field of life. Exercising reduces blood pressure, decreases the risk of falling down due to losing balance and risks of injury (hip or ankle fractures), slows down loss of muscles and bone mass, increases flexibility, improves balance and ability to move, helps maintaining ideal weight, ensures sleeping pattern, keeps away from tension and stress, offers health and a long life (Gönülateş, Saygın, İrez, 2010).

Today, the most popular class in fitness is zumba club. The reason for why zumba is that much popular is that its founder claims *"there is no correct or wrong method of doing this"*. Participants are encouraged to move to the rhythm and choreography is less official compared to other group exercises. Zumba is rather a party dance and accords with the popular motto *"Leave the workout aside and join the party"*. Currently, in 110000 regions, in 125 different countries in the world, 12 million people dance the zumba (Ljubojevic, Jakovljevic and Poprzen, 2014).

Zumba is combination of exercises that increase burning calories, improves cardiovascular system and increase the resistance of the whole body and form the basis for aerobic workout. Such natural approach to fitness exercises realize your goals such as ensuring body harmony, correcting your stance and strengthening bone muscle joints (Ljubojevic, Jakovljevic and Poprzen, 2014).

2. Method

20 sedentary women, who do not exercise regularly, do not have any disease and sportive injury participated in our study. Zumba exercises were given for 8 weeks; 3 days a week, with a duration of 60 minutes. While determining the intensity of the exercise during implementation, the formula of Target MUSCLE=Intensity of the Exercise (%) x (MHR-RHR)+RHR) karvonen was utilized (Zorba and Saygın, 2013).

The research group was applied, 3 days a week, a choreography consisting of complicated actions accompanied by various dance music as zumba exercise, with an intensity of 50-60% of targeted heart rate, for 60 minutes (including warming up and cooling) (Lukic, 2006). This application comprises of 8 to 10 types of zumba music; each type of music is given for 3-5 minutes allowing resting for 15 to 30-second intervals (Ljubojevic, Jakovljevic and Poprzen, 2014). All measurements and tests applied for the research group were applied twice as once two days before the beginning of workout program and once two days after the end of workout program.

Table: Applied Workout Program

	Zumba
Warming up (10-15 minutes)	Stretching activities (simple dancing steps, marching, steps, walking side by side)
Main part (40-45 minutes)	Choreography consisting of complicated actions accompanied by Salsa, Merengue, Cumbia, Tango, Reggeatton, Hiphop and other types of music used in many other types of dance.
Cooling (10-15 minutes)	Stretching activities, dance accompanied by light music that ensures mental and physical relaxation

In our study, immediately before and after the 8-weeks workout program, measurement tests were performed for body weight, height, flexibility, aerobic fitness, leg and back strength, grabbing strength, subcutaneous fat thickness, body fat percentage, blood pressure and resting heart rate of the subjects.

Identity information was taken into account for determining ages of the subjects participating in our study. Their heights were measured with height measuring device and recorded in cm and body weights were measured using electronic bascule and recorded in kg. For measuring flexibility values of the participants, sit and lie down test was applied (Zorba, 1999). In order to determine aerobic fitness, 20 m. shuttle run test was performed (Saygın et al. 2016). Leg and back strength was tested using backlift dynamometer, model 23527-3, manufactured by Lafayette Instrument Company (Özer 2001). For testing grabbing strength, measurement was made using Takkei brand hand dynamometer (Tamer, 2000). For measuring body composition, Holtain skinfold calliper that exerts 10 g/sq mm of pressure at every angle was used. Durning (1974) formula was utilized in order to calculate body fat percentages of the subjects together with the values obtained through measurement of triceps, biceps, abdominal and suprailiac skinfold which were pre-determined for this study (Gönülateş, Saygın and İrez, 2010). For measuring blood pressure, riester brand sphygmomanometer was used (Pehlivan, 2017). Resting heart rate: It was read and recorded, with Polar brand heart rate monitor, at the time when pulse was observed constantly at a certain value (Erkmen, Kaplan and Taşkın, 2005).

Statistical calculations were made on SPSS (version 18.0) program. As a result of the analysis of the data, it was seen that all parameters exhibited normal distribution. So, in comparison of pretest and post-test values of the groups, Paired t test was employed. Percentages (%) were considered for average difference. Level of significance was accepted to be $p < 0.05$.

3. Findings

**Table 1: Arithmetic Mean and Standard Deviation
for age and height values of Zumba group**

Variables	n	X\pmSs
Age (year)	20	21,30 \pm 2,29
Height (cm)	20	166,45 \pm 6,57

According to Table 1, age values of the women in zumba group were found to be $21,30 \pm 2,29$ whereas their height values were found to be $166,45 \pm 6,57$.

Table 2: Paired t test results for pretest and post-test values of body weight, body fat rate, max $\dot{V}O_2$, flexibility variables for Zumba group

Variables		N	X \pm Ss	Average Difference (%)	t	p
Body weight (kg)	Pretest	20	63,22 \pm 8,11	-4,08	10,715	,000
	Post-test	20	60,64 \pm 7,39			
Body Fat Rate (%)	Pretest	20	25,37 \pm 2,84	-8,86	5,560	,000
	Post-test	20	23,12 \pm 2,68			
Max $\dot{V}O_2$ (ml/kg $^{min^{-1}}$)	Pretest	20	22,28 \pm 3,64	15,70	-6,621	,000
	Post-test	20	25,78 \pm 3,43			
Flexibility (cm)	Pretest	20	28,20 \pm 8,53	15,24	-13,932	,000
	Post-test	20	32,50 \pm 8,00			

According to Table 2, there is significant difference with regard to body weight, body fat rate, $\dot{V}O_2$ Max and flexibility values of the women who participated in our study and are in Zumba group ($p < 0.05$).

Table 3: Paired t test results for pretest and post-test values of strength variables of Zumba group

Variables		N	X \pm Ss	Average Difference (%)	t	p
Leg strength (kg)	Pretest	20	48,99 \pm 12,99	11,85	-9,182	,000
	Post-test	20	54,80 \pm 11,66			
Back strength (kg)	Pretest	20	54,75 \pm 16,36	11,21	-10,107	,000
	Post-test	20	60,89 \pm 14,67			
Dominant grabbing strength (kg)	Pretest	20	27,35 \pm 4,18	0,73	-,015	,988
	Post-test	20	27,55 \pm 4,22			

Significant difference was found in values of leg strength and back strength of women in Zumba group ($p < 0.05$). However, no significant difference was found with regard to dominant grabbing strength ($p > 0,05$).

Table 4: Paired t test results for pretest and post-test values of blood pressure and resting heart rate variables for Zumba group

Variables		N	X \pm Ss	Average Difference (%)	t	p
Systolic blood pressure (mmHg)	Pretest	20	119,50 \pm 3,94	-0,41	1,000	,330
	Post-test	20	119,00 \pm 3,07			
Diastolic blood pressure (mmHg)	Pretest	20	79,50 \pm 3,94	0,62	-1,000	,330
	Post-test	20	80,00 \pm 3,24			
Resting heart rate (pulse/min)	Pretest	20	67,35 \pm 4,23	0,44	-,623	,541
	Post-test	20	67,65 \pm 3,70			

No significant difference was found with regard to systolic blood pressure, diastolic blood pressure and resting heart rate values of women who participated in our study and are in Zumba group ($p>0.05$).

4. Discussion and Conclusion

As a result of 8-week zumba exercises given to sedentary women, it was seen that this type of exercise caused physiological and physical differences. This difference tends to increase in value from the pretest to the post-test. These findings concerning such physical efficiency are similar with the results in the literature.

In the research by Biçer, Yüktaşır, Yalçın and Kaya (2009), the experimental group participates in 8-weeks (3 days a week, 60 minutes a day) aerobic dancing exercises. The study is designed in the form of single group as pretest-posttest. As a result; positive significant difference is found in terms of physical properties and this result corresponds to our study.

In the study by Ljubojevic, Jakovljevic and Poprzen (2014), 12 women at the age of 25-35 participate in the study. The zumba exercise program was applied for a total of 24 hours, three days a week for eight weeks. In the end of the program, significant decrease is found in values of body weight.

15 voluntary, healthy sedentary women participate in the study conducted by Çolakoğlu and Şenel (2003). The subjects were given aerobic exercise program for 8 weeks; 3 days a week, 40-45 minutes a day. The intensity of the exercise is determined as 40-60% with Karvonen method. As a result, significant difference is found with regard to body fat rate values of the subjects.

Barene, Krstrup, Jackman Brekke and Holterman (2013) report in their study that 2-3 hours of zumba exercise in a week causes decrease in body fat percentages of women. 36 women participated in another study carried out by Micallef (2014). Weekly 16 hours of zumba sessions, warming up and cooling activities, merengue, salsa and bachata are applied for 8 weeks. Apart from exercising, dietary and physical activity habits are changed. As a result of the research, positive significant difference is found with regard to body fat rate.

In the study by Tekin, Tekin, Çalışır and Bayrakdaroğlu (2014), participants join Tae Bo aerobic exercise for 3 months; lasting 3 days a week, 60 minutes a day. As a result, a significant increase is found with regard to Max $\dot{V}O_2$ values of the subjects.

In the study by Luetngen, Foster, Doberstein, Mikat and Porcari (2012), named *"zumba fitness party as a good exercise"*, a significant difference in the positive direction is found for Max $\dot{V}O_2$ value. This study corresponds to our study.

In the study by Najafnia, Bararpour, Amirinejahad and Nakhaee (2013), participants are given step aerobic exercise with an intensity of 50-60%, 3 days a week, for 8 weeks. Positive significance is found with regard to Max $\dot{V}O_2$ values of the participants.

In the study by Okonkwo (2012), named physiological responses to 60-minute zumba aerobic sessions of healthy adult women and energy consumption, significant difference is found with regard to *Maks* $\dot{V}O_2$ values.

In the study of [Delextrat](#), [Warner](#), [Graham](#) and [Neupert](#) (2014), named “8-weeks zumba exercises of healthy women improve aerobic fitness and psychological well-being”, positive significant difference is found for muscle strength values.

In the study by Kurt, Hazar, İbiş, Albay and Kurt (2010) for evaluation of effects of eight-week step-aerobic exercise of middle-aged sedentary women on several physical fitness parameters, 24,74% improvement in leg strength values and 14,5% improvement in back strength values is observed.

In the study of Cugusi et al. (2015) named effects of zumba fitness program of Italian fat women on body composition, cardiovascular, life and pain quality, decrease is noted in systolic and diastolic blood pressure.

60 obese men of 25-40 years old participate in the study of Raju (2014) named effect of 12-week aerobic dancing exercise of obese adult men on cardiovascular parameters. The exercise is performed for 12 weeks; 6 days a week, 60 minutes a day. At the end of the research, 1,98% improvement is recorded for diastolic blood pressure.

Considering findings of our study, it was found that 8-weeks zumba exercise had a positive effect on body weight, body fat rate, flexibility, back and leg strength, max $\dot{V}O_2$ values. However, it was found that it did not have significant impact on systolic and diastolic blood pressure, resting heart rate. It is supposed that duration, frequency and intensity of the exercise applied is adequate to positively affect physical fitness factors whereas more time is required in order to cause an effect on blood pressure and resting heart rate.

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